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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/731,087

12/10/2003

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204552031200

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04/04/2006

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EXAMINER

LEE, EUGENE

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/731,087	Applicant(s) MARIYAMA ET AL. <i>(mw)</i>	
	Examiner Eugene Lee	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 4-7, 10-15 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 9, 16, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/10/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species I (claims 1-3, 8, 9, 16, 18, and 19) in the reply filed on January 17, 2006 is acknowledged.

Claims 4 thru 7, 10 thru 15, and 17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/17/06.

Drawings

2. Figure 21-25 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 18, and 19 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim *should refer to other claims in the alternative only*. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits. Claim 18 is dependent on claims that were not elected.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 thru 3, 8, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshikawa JP 02125666 A. Yoshikawa discloses (see, for example, figure 5, and figure 7) a pair of photo thyristors (bidirectional photothyristor chip) packaged in one chip comprising a first photo thyristor (first photothyristor portion), second photo thyristor (second photothyristor portion), and isolation region (channel isolation region) 30. The isolation region extends in a direction that intersects the channel, which is between first anode 22, and first cathode 24, of the first photo thyristor and the channel, which is between second anode 25, and second cathode 27 of the second photo thyristor.

Regarding claims 2, and 3, see, for example, figure 7 wherein Yoshikawa discloses first anode (first diffusion layer) 22, and first cathode (second diffusion layer) 24; and second anode (first diffusion layer) 25, and second cathode (second diffusion layer) 27.

Regarding claim 8, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitation. *Ex Parte Masham*, 2 USPQ F. 2d 1647 (1987). In this case, the diffusion regions may interchangeably be the cathode or anode based on the voltages applied to the device. Therefore, such a functional limitation does not structurally differentiate the applicant's device from the cited prior art.

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Regarding claim 9, see, for example, figure 7 wherein Yoshikawa discloses gate photoreceptor diffusions 23, 26.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa JP 02125666 A as applied to claims 1-3, 8, and 9 above, and further in view of Darwish 5,278,076. Yoshikawa discloses (see, for example, figure 7) an N- type substrate 21. Yoshikawa does not disclose an N+ layer. However, Darwish discloses (see, for example, FIG. 1) a thyristor comprising an n+ buried layer (N+ layer) 21. In column 3, lines 28-31, Darwish discloses the n+ buried layer having low resistivity and enhancing the current carrying capacity. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have an N+ layer in order to have low resistivity and enhance current carrying capacity.

Yoshikawa in view of Darwish does not disclose phosphorus. However, phosphorus is an n-type dopant used in the art. It would have been obvious to one of ordinary skill in the art at the time of invention was made to use a material such as phosphorus in order to have a highly doped n-type region that enhances current carrying capacity since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Yoshikawa in view of Darwish does not disclose a concentration of not smaller than 10^{15} cm^{-3} and not larger than 10^{18} cm^{-3} . However, it was well within the skills of an artisan in the art to optimize the performance of a semiconductor device by adjusting the concentration of a highly doped n-type region in order to provide a region that enhances current carrying capability. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention

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was made to have a concentration of not smaller than 10^{15} cm^{-3} and not larger than 10^{18} cm^{-3} because it was well within the skills of an artisan to optimize the performance of a semiconductor device by adjusting the concentration of a highly doped n-type region in order to enhance current carrying capability. See *In re Aller*, 105 USPQ 233.

7. Claims 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa JP 02125666 A as applied to claims 1-3, 8, and 9 above, and further in view of Mariyama 6,037,613. Yoshikawa does not disclose a light-fired coupler, light emitting diode, and snubber circuit. However, Mariyama discloses (see, for example, FIG. 6) a configuration comprising an ignition (light-fired coupler) 70, light emitting diode 71, and resistor/capacitor (snubber circuit) 74/75. It would have been obvious to one of ordinary skill in the art at the time of invention to have a light-fired coupler, light emitting diode, and snubber circuit in order to implement the bidirectional photothyristor in a more robust device such as a solid state relay.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

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ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1 thru 3, 8, 9, 16, 18, and 19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 thru 78 of copending Application No. 11/080,522. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 9 of the applicant's invention is not patentably distinct from claim 1 of Application No. 11/080,522.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eugene Lee
March 27, 2006

A handwritten signature in black ink, appearing to be 'Eugene Lee', written in a cursive style.